From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

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28-03-2005
REINHOLD COHN AND PARTNERS

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NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing *(day/month/year)*	22.03.2005
Applicant's or agent's file reference 149714.8 SB	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IL 03/00947	12.11.2003	14.11.2002

Applicant
Q-CORE LTD.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:

European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
149714.8 SB		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IL 03/00947	12.11.2003	14.11.2002
International Patent Classification (IPC) or both national classification and IPC		
F04B43/09		
Applicant		
Q-CORE LTD.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☒ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
14.06.2004	22.03.2005
Name and mailing address of the international preliminary examining authority:	Authorized Officer
European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Kolby, L Telephone No. +31 70 340-2204

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IL 03/00947

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-16	as originally filed

Claims, Numbers

1-20	received on 21.06.2004 with letter of 14.06.2004

Drawings, Sheets

1/18-18/18	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

   ☐ restricted the claims.

   ☐ paid additional fees.

   ☐ paid additional fees under protest.

   ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

   see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

   ☒ all parts.

   ☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-20
	No:	Claims	
Inventive step (IS)	Yes:	Claims	12,13,14
	No:	Claims	1-11,15-20
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item IV

Lack of unity of invention

1. This Authority considers that there are 2 inventions covered by the claims indicated as follows:

I: Claims 1-11 and 13-20 directed to a pump for generating fluid flow.

II: Claim 12 directed to a driving mechanism for use in a pump.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:
The special technical features (STF), i.e those technical features that define a contribution which each of the claimed inventions, makes over the prior art, are not the same nor corresponding for the for the two groups of inventions (Rule 13.2 PCT). Therefore, neither the problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, therefore, the 2 groups of claims are not linked by common or corresponding special technical features and define different inventions not linked by a single general inventive concept. The application, hence does not meet the requirements of Unity of Invention as defined in Rule 13(1) & (2) PCT.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: US-A-4 014 318 (NITZKOWSKI NORMAN H ET AL) 29 March 1977 (1977-03-29)

D2: US-B-6 450 773 (UPTON ERIC LAWRENCE) 17 September 2002 (2002-09-17)

D3: US-A-5 577 891 (LOUGHNANE MICHAEL H ET AL) 26 November 1996 (1996-11-26)

The document D2. was not cited in the international search report.

2. Claims 1-11 and 13-20:

Claim 1 contains a reference to the drawings (Figure 4). According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.

2.1 One possible clarification would have been to introduce the following features into claim 1:
i) that both the valves V_1 and V_3 and the valves V_2 and V_4 are operatively coupled so that the valve head of the valve V_1 and the valve head of the valve V_3 are not open or closed simultaneously and the valve head of the valve V_2 and the valve head of the valve V_4 are not open or closed simultaneously;
and
ii) that starting from a position where the valve heads of V1 and V2 are in a down position, the operatively coupled valves (V_1,V_3 and V_2,V_4) are alternately activated, starting by moving the valve head of V1 to an up position.

2.2 Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of claim 1, as far as it can be understood, does not involve an inventive step in the sense of Article 33(3) PCT, and therefore the criteria of Article 33(1) PCT are not met.

2.3 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document) (see figures 1,3 and 6a): A pump for generating fluid flow in an elastic tubular conduit (18) having a lumen, comprising:
(a) four electrically operated valves (12,14,16,17), each valve being positionable adjacent to the conduit (18), each valve having a valve head (34), the valve head (34) configured to alternate from a first position in which the lumen of the conduit adjacent to the valve head is unobstructed and a second position in which the lumen of the conduit adjacent to the valve head is obstructed; and
(b) a driver, comprising at four electromagnets (40,46), configured to control the positions of the valve heads (34), so as to execute a temporo-spatial array of valve head positions.

2.4 The subject-matter of claim 1 therefore differs from this known pump in that temporo-spatial array of valve head positions has to be according to Fig. 4.

2.5 Document D1 does not disclose the sequence of valve head positions for the four valve configuration. However, the sequence according to Fig. 4 would be one of several

straightforward possibilities from which the skilled person would select without the exercise of inventive skill. This sequence of valve head positions according to Fig. 4 has also already been employed for the same purpose in a similar pump, see document D2, Figures 5A-5E. It would therefore be obvious to the person skilled in the art, to apply this sequence according to D2 in the pump according to D1, thereby arriving at a pump according to claim 1.

The subject-matter of claim 1 does therefore involve an inventive step (Article 33(3) PCT).

2.6 The dependent claims 2-11 and 15-20 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), since they either relate to normal design options or to technical measures well know in the field of pumps.

2.7 The combination of the features of dependent claims 13 and 14 is neither known from, nor rendered obvious by, the available prior art. Therefore the solutions proposed in claims 13 and 14 of the present application is considered as involving an inventive step (Article 33(3) PCT).

2.8 The subject-matter of claims 1-11 and 13-20 is deemed to be industrially applicable, as required by Article 33(4) PCT.

3. Claim 12:

The independent claim 12 is directed to a driving mechanism for use in a pump according to any one of the previous claims, i.e. a driving mechanism **suitable** for use in a pump according to any one of the previous claims (see PCT Guidelines Chapter 12, 12.05 and Chapter 5, 5.23).

3.1 Another prior art document D3 discloses a driving mechanism comprising: an lever pivotable around an axis, whereby the lever is actuated by means of an eccentric rotating device mounted on a rotating shaft.

3.2 The independent claim 12 is distinguished from these closest prior art documents D1 and D3 by at least the following features: a first auxiliary lever; a second auxiliary lever; an intermittently activatable electromagnet generating, when activated, a magnetic field between a first metal core arm and a second metal core arm; wherein the magnetic field causes rotation of an auxiliary lever about the axis when extremities

of the lever arm are not between the first and second core arms so as to bring the extremities between the first and second core arms.

The subject-matter of claim 12 is therefore new (Article 33(2) PCT).

3.3 The problem to be solved by the present invention may be regarded as providing an alternative driving mechanism for use in a pump.

3.4 The solution (see §3.2) to this problem proposed in claim 12 of the present application is considered as involving an inventive step (Article 33(3) PCT) because this solution is not rendered obvious by any of the documents D1 or D3 nor by a combination of these documents or any other prior art designs, since the state of the art does not offer any hints towards this solution.

3.5 The invention is industrial applicable in the field of pumps (Article 33(4) PCT).

CLAIMS:

1. A pump for generating fluid flow in an elastic tubular conduit having a lumen, comprising:

(a) four electrically operated valves, each valve being positionable adjacent to the conduit, each valve having a valve head, the valve head configured to alternate from a first position in which the lumen of the conduit adjacent to the valve head is unobstructed and a second position in which the lumen of the conduit adjacent to the valve head is obstructed; and

(b) a driver, comprising at least one electromagnet, configured to control the positions of the valve heads, so as to execute the temporo-spatial array of valve head positions of Fig. 4.

2. The pump according to Claim 1, wherein the valve heads have a first dimension positionable perpendicular to the axis of the conduit and a second dimension positional parallel to the axis of the conduit, the second dimension of all of the valve heads being equal.

3. The pump according to Claim 1, wherein the valve heads have a first dimension perpendicular to the axis of the conduit and a second dimension parallel to the axis of the conduit, and wherein the second dimensions are not all equal or the shape of the valve heads are not all the same.

4. The pump according to any one of the previous claims having a base configured to maintain a segment of the conduit in a straight line or in an S shape.

5. The pump according to any one of the previous claims wherein the tubular conduit is held in a sleeve.

6. The pump according to any one of the previous claims wherein the tubular conduit is preloaded.

7. The pump according to any one of the previous claims wherein one or more valve heads is oblique to the conduit.

8. The pump according to any one of the previous claims further comprising a communications device for transmitting information to a remote receiver.

9. A pumping system comprising two or more pumps according to any one of the previous claims.

10. The pumping system according to Claim 9 comprising two or more pumps in which at least two pumps are arranged in series.

11. The pumping system according to Claim 9 comprising two or more pumps in which at least two pumps are arranged in parallel.

12. A driving mechanism for use in a pump according to any one of the previous claims comprising:

(a) an X shaped metal lever pivotable around an axis;

(b) A first auxiliary lever pivotable about the axis;

(c) A second auxiliary lever pivotable about the axis;

(d) An intermittently activatable electromagnet generating, when activated, a magnetic field between a first metal core arm and a second metal core arm;

wherein the magnetic field causes rotation of an auxiliary lever about the axis when extremities of the lever arm are not between the first and second core arms so as to bring the extremities between the first and second core arms.

13. A pump according to any one of claims 1 to 8 comprising the mechanism of Claim 12.

14. A pump according to any one of claims 1 to 8, comprising:

(a) a lever bar pivotable around an axle, having a first end and a second end;

(b) a first valve head attached to the first end of the lever bar;

(c) a second valve head attached to the second end of the lever bar; and

(d) an electromagnet rotating the lever arm between a first configuration in which the first valve head is in an up position and the second valve head is in a down position, and a second configuration in which the first valve head is in a down position and the second valve head is in an up position.

15. A pump according to any one of claims 1 to 8, 13 and 14 operated by batteries.

16. A pump according to any one of claims 1 to 8, and 13 to 15 comprising a control panel that is detachable from the rest of the pump.

17. The pump according to Claim 16 wherein communication between the control panel and the rest of the pump is via an electric cable.

18. The pump according to Claim 16 wherein communication between the control panel and the rest of the pump is via a wireless connection.

19. The pump according to any one of claims 1 to 8, 13 to 18 further comprising a transceiver communicating with a remote station.

20. The pump according to any one of claims 1 to 18 and 13 to 19 further comprising an anti-free flow device.

MAIL STOP PCT
Attorney Docket: 26784U

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
BEN SHALOM et al.
International Application Number: PCT/IL2003/000947
Serial Number: NOT YET ASSIGNED
International Filing Date: 12 November 2003 (12.11.2003)
Filing Date: May 16, 2005
For: **PERISTALTIC PUMP**

PRELIMINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to examining on the merits and calculating the filing fee for the national phase patent application filed herewith, please enter the following amendments to the International Preliminary Examination Report in the captioned application:

IN THE SPECIFICATION:

Please amend the specification on page 1 on the first line after the title and before the heading of the first paragraph with the following paragraph as shown in Attachment A.

IN THE CLAIMS:

Please amend claims 4-9, 12-13, 15-16 and 19-20 for the application filed herewith and as shown on the marked-up Attachment B.

MAIL STOP PCT
Attorney Docket No.: 26784U

REMARKS

The above amendments have been made to remove multiple dependencies from the claims and to conform them to U.S. practice. No new matter has been added.

Respectfully submitted,
NATH & ASSOCIATES PLLC

Date: May 16, 2005

By: _____

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GMN/JLM/ng: PrelimAmend

MAIL STOP PCT
Attorney Docket No.: 26784U

Attachment A

In the Specification:

On the first page of the specification, after the title and before the heading of the first paragraph, please insert the following paragraph.

This application claims the benefit of PCT International Application No. PCT/IL2003/000947 filed 12 November 2003, the contents of which are hereby incorporated herein by reference in their entirety.

Attachment B

1. **(previously presented)** A pump for generating fluid flow in an elastic tubular conduit having a lumen, comprising:

(a) four electrically operated valves, each valve being positionable adjacent to the conduit, each valve having a valve head, the valve head configured to alternate from a first position in which the lumen of the conduit adjacent to the valve head is unobstructed and a second position in which the lumen of the conduit adjacent to the valve head is obstructed; and

(b) a driver, comprising at least one electromagnet, configured to control the positions of the valve heads, so as to execute the temporo-spatial array of valve head positions of Fig. 4.

2. **(previously presented)** The pump according to Claim 1, wherein the valve heads have a first dimension positionable perpendicular to the axis of the conduit and a second dimension positional parallel to the axis of the conduit, the second dimension of all of the valve heads being equal.

3. **(previously presented)** The pump according to Claim 1, wherein the valve heads have a first dimension perpendicular to the axis of the conduit and a second dimension parallel to the axis of the conduit, and wherein the second dimensions are not all equal or the shape of the valve heads are not all the same.

4. **(currently amended)** The pump according to ~~any one of the previous claims~~ Claim 1 having a base configured to maintain a segment of the conduit in a straight line or in an S shape.

5. **(currently amended)** The pump according to ~~any one of the previous claims~~ Claim 1 wherein the tubular conduit is held in a sleeve.

6. **(currently amended)** The pump according to ~~any one of the~~

~~previous claims~~ Claim 1 wherein the tubular conduit is preloaded.

7. **(currently amended)** The pump according to ~~any one of the previous claims~~ Claim 1 wherein one or more valve heads is oblique to the conduit.

8. **(currently amended)** The pump according to ~~any one of the previous claims~~ Claim 1 further comprising a communications device for transmitting information to a remote receiver.

9. **(currently amended)** A pumping system comprising two or more pumps according to ~~any one of the previous claims~~ Claim 1.

10. **(previously presented)** The pumping system according to Claim 9 comprising two or more pumps in which at least two pumps are arranged in series.

11. **(previously presented)** The pumping system according to Claim 9 comprising two or more pumps in which at least two pumps are arranged in parallel.

12. **(currently amended)** A driving mechanism for use in a pump according to ~~any one of the previous claims~~ Claim 1 comprising:

(a) an X shaped metal lever pivotable around an axis;

(b) A first auxiliary lever pivotable about the axis;

(c) A second auxiliary lever pivotable about the axis;

(d) An intermittently activatable electromagnet generating, when activated, a magnetic field between a first metal core arm and a second metal core arm;

wherein the magnetic field causes rotation of an auxiliary lever about the axis when extremities of the lever arm are not between the first and second core arms so as to bring the extremities between the first and second core arms.

13. **(currently amended)** A pump according to ~~any one of claims 1 to 8~~ Claim 1 comprising ~~the mechanism of Claim 12~~ a mechanism comprising:

(a) an X shaped metal lever pivotable around an axis;

(b) A first auxiliary lever pivotable about the axis;

(c) A second auxiliary lever pivotable about the axis;

(d) An intermittently activatable electromagnet generating, when activated, a magnetic field between a first metal core arm and a second metal core arm;

wherein the magnetic field causes rotation of an auxiliary lever about the axis when extremities of the lever arm are not between the first and second core arms so as to bring the extremities between the first and second core arms.

14. (currently amended) A pump according to ~~any one of claims 1 to 8~~ Claim 1, comprising:

(a) a lever bar pivotable around an axle, having a first end and a second end;

(b) a first valve head attached to the first end of the lever bar;

(c) a second valve head attached to the second end of the lever bar; and

(d) an electromagnet rotating the lever arm between a first configuration in which the first valve head is in an up position and the second valve head is in a down position, and a second configuration in which the first valve head is in a down position and the second valve head is in an up position.

15. (currently amended) A pump according to ~~any one of claims 1 to 8, 13 and 14~~ Claim 1 operated by batteries.

16. (currently amended) A pump according to ~~any one of claims 1 to 8, 13 and 15~~ Claim 1 comprising a control panel that is detachable from the rest of the pump.

17. (previously presented) The pump according to Claim 16 wherein communication between the control panel and the rest of the pump is via an electric cable.

18. (previously presented) The pump according to Claim 16 wherein

communication between the control panel and the rest of the pump is via a wireless connection.

19. (currently amended) The pump according to ~~any one of claims 1 to 8, 13 and 18~~ Claim 1 further comprising a transceiver communicating with a remote station.

20. (currently amended) The pump according to ~~any one of claims 1 to 8, 13 and 19~~ Claim 1 further comprising an anti-free flow device.